Electrical low frequency stimulation of VL nucleus of the thalamus was performed with a bipolar stimulating electrode of 0.5 mm distance on 20 cases of extrapyramidal disorders. The evoked potentials were recorded with monopolar and bipolar scalp leads and displayed on paper as well as oscillographic records. The evoked potentials were noted mostly on the ipsilateral side of the fronto-parietal region in the regular suprathreshold stimulation, but bilateral evoked potentials with highest amplitude of the ipsilateral fronto-parietal region at the excessive suprathreshold stimulation. EEG of the fronto-parietal region was analysed before, during and after the VL stimulation by means of Walter-type band-pass filter apparatus. It was interesting that clear waxing and waning phenomena were observed in the analysed band, which was concordant with the frequency of stimulation. When 6 cps stimulation was applied, the phenomena were obtained in the $\theta$ band, 10 cps in the $\alpha$ band. The evoked potentials were assumed as an augmenting response of the thalamic stimulation.

An averaged response was recorded on the medical data processing computer. The response showed primary positive phase with 5 to 10 msec and following large negative phase with 30 to 40 msec of peak latencies, which led into a more variable positive wave with peak latency 56–65 msec. The peak latencies of both primary positive and negative phase showed fairly constant duration in the stimulations of lower frequencies. When the stimulations of higher frequencies were applied, the second surface positivity became lower and lower in amplitude and finally disappeared at 15 cps stimulation of VL nucleus. The second positivity showed maximum amplitude at the 5 to 8 cps stimulation.

However, in a case of parkinsonian patient who showed typical augmenting response with 5-10 cps stimulation, recruiting-like response was noted with 17 cps stimulation. The position of the tip of the stimulating electrode was checked roentgenologically, and identified to be in the regular VL area of the thalamus. It could be considered that ventrolateral nucleus of the human thalamus has some similar nature to diffuse projecting systems in it or close relation to them electrophysiologically.